

On a separate piece of paper, solve the following problems **showing ALL work**.

Calculate the mass in grams of each of the following:

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|---|---|
| 1) 5.0 moles of carbon | 4) 4.0 moles of mercury |
| 2) 8.00 moles of aluminum | 5) 7.00 moles of elemental iodine (I_2) |
| 3) 10.5 moles of elemental oxygen (O_2) | 6) 200 moles of sodium |

Calculate the number of moles in the following:

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|---------------------|-------------------------|
| 7) 800 g of calcium | 10) 66 g of manganese |
| 8) 280 g of krypton | 11) 93 g of phosphorous |
| 9) 560 g of zinc | 12) 72 g of silicon |

Calculate the mass in grams of the following:

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|---|-------------------------------|
| 13) 5.4 moles of ZnO | 16) 200 moles of Al_2O_3 |
| 14) 12.0 moles of PbS | 17) 40 moles of Na_2CO_3 |
| 15) 7.50 moles of sugar($C_{12}H_{22}O_{11}$) | 18) 8.7 moles of $Ca(NO_3)_2$ |

Calculate the number of moles in each of the following:

- | | |
|---------------------------------|-------------------------|
| 19) 400 grams of NaOH | 22) 119.78 g of Ag_2O |
| 20) 599 grams of $Pb_3(PO_4)_2$ | 23) 312 g of H_2O |
| 21) 5 grams of CoS | 24) 0.38 grams MgO |

The following problems deal with the amount of gas in a mole. However, specific conditions must apply to the gas substance for these answers to be correct. We will learn in the Gas Laws Unit that the volume of a gas will change with temperature and pressure. For these problems we will assume that the gases are at standard temperature and pressure (STP). We will learn more about this later.

Note: There are 22.4 L of gas in one mole at STP.

How many moles of gas are in the following:

25) 33.3 L H_2

27) 44.8 L N_2

29) 100 L CH_4

26) 500 L C_3H_8

28) 99.9 L Cl_2

How many liters of gas (@ STP) are in the following?

30) 234 mol Ar

32) 1 mol Kr

31) 2.89 mol N_2

33) 0.02 mol H_2

Calculate the following:

34) mass of CO_2 in 34 L

35) volume in mL occupied by 10 g CO_2

36) mass in mg of 100 mL of SO_3